



SEQUENCE LISTING

RECEIVED

JUL 26 2002

TECH CENTER 1600/2900

<110> Hogrefe, Holly
Hansen, Connie J

<120> Polymerase Enhancing Factor (PEF) Extracts, PEF Protein Complexes, Isolated PEF Proteins, and Methods for Purifying and Identifying

<130> 4121.0116-02

<140> US 09/399,003

<141> 1999-09-20

<150> PCT/ US98/05497

<151> 1998-03-20

<150> US 08/957,709

<151> 1997-10-24

<150> US 08/822,774

<151> 1997-03-21

<160> 89

<170> PatentIn version 3.1

<210> 1

<211> 15

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> misc_feature

<222> (1)..(15)

<223> "X" represents any amino acid

<400> 1

Xaa	Xaa	Leu	His	His	Val	Lys	Leu	Ile	Tyr	Ala	Thr	Xaa	Xaa	Xaa
1				5					10					15

<210> 2

<211> 15

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> misc_feature

<222> (1)..(15)

<223> "X" represents any amino acid

<400> 2

Xaa	Xaa	Xaa	Pro	Asp	Trp	Xaa	Xaa	Arg	Xaa	Glu	Xaa	Leu	Xaa	Xaa
1				5					10					15

<210> 3

<211> 35

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(35)

<223> "X" represents any amino acid

<400> 3

Xaa	Leu	Leu	His	His	Val	Lys	Leu	Ile	Tyr	Ala	Thr	Lys	Xaa	Arg	Xaa
1				5					10					15	

82

C

Leu Val Gly Lys Xaa Ile Val Leu Ala Ile Pro Gly Xaa Xaa Ala Xaa
20 25 30

Xaa Xaa Xaa
35

<210> 4

<211> 18

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(18)

<223> "X" represents any amino acid

<400> 4

Xaa Xaa Xaa Pro Asp Trp Xaa Xaa Arg Xaa Glu Xaa Leu Xaa Glu Xaa
1 5 10 15

Xaa Xaa

<210> 5

<211> 17

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(17)

<223> "X" represents any amino acid

<400> 5

Xaa Tyr Asp Ala Val Ile Met Ala Ala Ala Val Val Asp Phe Arg Pro
1 5 10 15

83

Cr

Lys

<210> 6

<211> 24

<212> PRT

<213> Pyrococcus furiosus

<400> 6

Ala Asp Leu Val Val Gly Asn Thr Leu Glu Ala Phe Gly Ser Glu Glu
1 5 10 15

Asn Gln Val Val Leu Ile Gly Arg
20

<210> 7

<211> 17

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(17)

<223> "X" represents any amino acid

<400> 7

Gly Ala Met Leu His His Val Lys Leu Ile Tyr Ala Xaa Lys Leu Arg
1 5 10 15

Lys

<210> 8

<211> 18

<212> PRT

<213> Pyrococcus furiosus

84

Q

<220>

<221> misc_feature

<222> (1)..(18)

<223> "X" represents any amino acid

<400> 8

Gly Ala Met Leu His His Val Lys Leu Ile Tyr Ala Thr Lys Xaa Xaa
1 5 10 15

Arg Lys

<210> 9

<211> 13

<212> PRT

<213> Pyrococcus furiosus

<400> 9

Met Leu His His Val Lys Leu Ile Tyr Ala Thr Lys Leu
1 5 10

<210> 10

<211> 16

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(16)

<223> "X" represents any amino acid

<400> 10

Gly Xaa Xaa Xaa Pro Asp Trp Xaa Xaa Lys Phe Arg Lys Glu Glu Ser
1 5 10 15

<210> 11

<211> 17

<212> PRT

<213> Pyrococcus furiosus

<400> 11

Gly Ala Ile Leu Leu Pro Asp Trp Lys Ile Arg Lys Glu Ile Leu Ile
1 5 10 15

Glu

<210> 12

<211> 16

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(16)

<223> "X" represents any amino acid

<400> 12

Xaa Met His His Val Ile Lys Leu Xaa Tyr Ala Thr Xaa Ser Arg Lys
1 5 10 15

<210> 13

<211> 18

<212> PRT

<213> Pyrococcus furiosus

<400> 13

Met Leu Tyr Leu Val Arg Pro Asp Trp Lys Arg Arg Lys Glu Ile Leu
1 5 10 15

Ile Glu

SC

Q

<210> 14
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic
<400> 14
caycaygaha arythattta cgc

23

<210> 15
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic
<220>
<221> misc_feature
<222> (1)..(23)
<223> "n" is a, t, g, or c

<400> 15
gccatdatna cdgcrtcgtta ttt

23

<210> 16
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic
<400> 16
caycaygaha arythatata cgc

23

<210> 17
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic
 <400> 17
 ardacdacyt grttttcttc

20

<210> 18
 <211> 1209
 <212> DNA
 <213> Pyrococcus furiosus

<220>
 <221> misc_feature
 <222> (1)..(1209)
 <223> "n" is a, t, g, or c

<400> 18
 atgcttcacc acgtcaagct aatctacgcc acaaaaagtc gaaagctagt tggaaaaaag 60
 atagtcnnnn nnnnccagg gagtattgcg gctttggatg tgaaagcttg tgagggacta 120
 attagggcatg gggccgaagt tcatgcagtg atgagtgagg cagccaccaa gataattcat 180
 ccttatgcat ggaatttgcc cacgggaaat ccagtcataa ctgagatcac tggatttatt 240
 gagcatgttg agtttagcagg ggaacatgag aataaagcag atttaatttt ggtttgcct 300
 gccactgcca acacaattag taagattgca tgtggaatag atgatactcc agtaactaca 360
 gtcgtgacca cagcatttcc ccacattcca attatgatag cccagcaat gcatgagaca 420
 atgtacaggc atcccatagt aagggagaac attgaaaggt taaagaagct tggcggtgag 480
 tttataggac caagaattga ggagggaaag gcaaaagttg caagcattga tgaaatagtt 540
 tacagagtta ttaaaaagct ccacaaaaaa acattggaag ggaagagagt cctagtaacg 600
 gcgggagcaa caagagagta catagatcca ataagattca taacaaatgc cagcagtgga 660
 aaaatgggag tagcgttggc tgaagaagca gatttttagag gagctgttac cctcataaga 720

acaaagggaa gtgtaaaggc ttttagaatc agaaaaatca aattgaaggt tgagacagtg 780
 gaagaaatgc tttcagcgat tgaaaatgag ttgaggagta aaaagtatga cgtagttatt 840
 atggcagctg ctgtaagcga ttttaggccca aaaattaaag cagagggaaa aattaaaagc 900
 ggaagatcaa taacgataga gctcgttccn nnnaatccca aaatcattga tagaataaag 960
 gaaattcaac caaatgtctt tcttgttgga tttaaagcag aaacttcaaa agaaaagctt 1020
 atagaagaag gtaaaaggca gattgagagg gccaaaggctg acttagtcgt tggtaacaca 1080
 ttggaagcct ttggaagcga ggaaaaccaa gtagtattaa ttggcagaga tttcacaaaa 1140
 gaacttccaa aaatgaaaaa gagagagtta gcagagagaa tttgggatga gatagagaaa 1200
 ttntctgtcc 1209

<210> 19

<211> 403

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(403)

<223> "X" represents any amino acid

<400> 19

Met Leu His His Val Lys Leu Ile Tyr Ala Thr Lys Ser Arg Lys Leu
1 5 10 15

Val Gly Lys Lys Ile Val Xaa Xaa Xaa Pro Gly Ser Ile Ala Ala Leu
20 25 30

Asp Val Lys Ala Cys Glu Gly Leu Ile Arg His Gly Ala Glu Val His
35 40 45

Ala Val Met Ser Glu Ala Ala Thr Lys Ile Ile His Pro Tyr Ala Trp
50 55 60

Asn Leu Pro Thr Gly Asn Pro Val Ile Thr Glu Ile Thr Gly Phe Ile
65 70 75 80

Glu His Val Glu Leu Ala Gly Glu His Glu Asn Lys Ala Asp Leu Ile
85 90 95

Leu Val Cys Pro Ala Thr Ala Asn Thr Ile Ser Lys Ile Ala Cys Gly
 100 105 110
 Ile Asp Asp Thr Pro Val Thr Thr Val Val Thr Thr Ala Phe Pro His
 115 120 125
 Ile Pro Ile Met Ile Ala Pro Ala Met His Glu Thr Met Tyr Arg His
 130 135 140
 Pro Ile Val Arg Glu Asn Ile Glu Arg Leu Lys Lys Leu Gly Val Glu
 145 150 155 160
 Phe Ile Gly Pro Arg Ile Glu Glu Gly Arg Ala Lys Val Ala Ser Ile
 165 170 175
 Asp Glu Ile Val Tyr Arg Val Ile Lys Lys Leu His Lys Lys Thr Leu
 180 185 190
 Glu Gly Lys Arg Val Leu Val Thr Ala Gly Ala Thr Arg Glu Tyr Ile
 195 200 205
 Asp Pro Ile Arg Phe Ile Thr Asn Ala Ser Ser Gly Lys Met Gly Val
 210 215 220
 Ala Leu Ala Glu Glu Ala Asp Phe Arg Gly Ala Val Thr Leu Ile Arg
 225 230 235 240
 Thr Lys Gly Ser Val Lys Ala Phe Arg Ile Arg Lys Ile Lys Leu Lys
 245 250 255
 Val Glu Thr Val Glu Glu Met Leu Ser Ala Ile Glu Asn Glu Leu Arg
 260 265 270
 Ser Lys Lys Tyr Asp Val Val Ile Met Ala Ala Ala Val Ser Asp Phe
 275 280 285
 Arg Pro Lys Ile Lys Ala Glu Gly Lys Ile Lys Ser Gly Arg Ser Ile
 290 295 300
 Thr Ile Glu Leu Val Pro Xaa Asn Pro Lys Ile Ile Asp Arg Ile Lys
 305 310 315 320
 Glu Ile Gln Pro Asn Val Phe Leu Val Gly Phe Lys Ala Glu Thr Ser
 325 330 335
 Lys Glu Lys Leu Ile Glu Glu Gly Lys Arg Gln Ile Glu Arg Ala Lys
 340 345 350

Ala Asp Leu Val Val Gly Asn Thr Leu Glu Ala Phe Gly Ser Glu Glu
355 360 365

Asn Gln Val Val Leu Ile Gly Arg Asp Phe Thr Lys Glu Leu Pro Lys
370 375 380

Met Lys Lys Arg Glu Leu Ala Glu Arg Ile Trp Asp Glu Ile Glu Lys
385 390 395 400

Xaa Leu Ser

<210> 20

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 20
catagcgaat tgcgaaaacc tttcgcggtg

33

<210> 21

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 21
actacggaat tccacggaaa atgccgctca tcc

33

<210> 22

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 22

ggcgtttccg ttcttcttcg

20

<210> 23

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 23

ccatctcacg cgccagtttc

20

<210> 24

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 24

gaggagagca ggaaaggtgg aac

23

<210> 25

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 25

gctgggagaa gacttcactg g

21

<210> 26

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 26

gagcttgctc aactttatc

19

<210> 27

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 27

gatagagata gtttctggag acg

23

<210> 28

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 28

cgggatatcg acatttctgc acc

23

<210> 29

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 29
gagttaaatg cctacactgt atct

24

<210> 30

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 30
caggactcag aagctgctat cgaa

24

<210> 31

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 31
ctgcacgtgc cctgtaggat ttgt

24

<210> 32

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<220>

<221> misc_feature

<222> (1)..(23)

<223> "n" is a, t, g, or c

<400> 32
ccagaytgga arwknaggaa aga

23

<210> 33

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<220>

<221> misc_feature

<222> (1)..(23)

<223> "n" is a, t, g, or c

<400> 33
ccagaytgga arwknagaaa aga

23

<210> 34

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<220>

<221> misc_feature

<222> (1)..(23)

<223> "n" is a, t, g, or c

<400> 34
ccagaytgga arwknaggaa gga

23

<210> 35

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<220>

<221> misc_feature

<222> (1)..(23)

<223> "n" is a, t, g, or c

<400> 35

ccagaytgga arwknagaaa gga

23

<210> 36

<211> 84

<212> DNA

<213> Pyrococcus furiosus

<220>

<221> misc_feature

<222> (1)..(84)

<223> "n" is a, t, g, or c

<400> 36

cagagtgggc agagaggctn ttgttaagg gaaattaatc gacgtggaaa aggaaggaaa

60

agtcgntatt cctccaagg aata

84

<210> 37

<211> 27

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(27)

<223> "X" represents any amino acid

<400> 37

Glu Trp Ala Glu Arg Leu Leu Leu Arg Gly Asn Xaa Ser Lys Trp Lys
1 5 10 15

Arg Lys Glu Lys Ser Xaa Phe Leu Gln Gly Asn
20 25

<210> 38

<211> 27

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(27)

<223> "X" represents any amino acid

<400> 38

Arg Val Gly Arg Glu Ala Xaa Val Lys Gly Lys Leu Ile Glu Val Glu
1 5 10 15

Lys Glu Gly Lys Val Xaa Ile Pro Pro Arg Glu
20 25

<210> 39

<211> 28

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(28)

<223> "X" represents any amino acid

<400> 39

Gln Ser Gly Gln Arg Gly Xaa Cys Xaa Gly Glu Ile Asn Arg Ser Gly
1 5 10 15

Lys Gly Arg Lys Ser Arg Tyr Ser Ser Lys Gly Leu
20 25

<210> 40

<211> 129

<212> DNA

<213> Pyrococcus furiosus

<400> 40

ctgcccactc tgaggtcata acctgctggt tggagccatt cttcagaaaa tggctctata 60
agtattttctt ttctgatttt ccagtcctgga agtagcattt taccaccgaa acctttattt 120
ttaatttaa 129

<210> 41

<211> 42

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(42)

<223> "x" represents any amino acid

<400> 41

Xaa Ile Lys Asn Lys Gly Phe Gly Gly Lys Met Leu Leu Pro Asp Trp
1 5 10 15

Lys Ile Arg Lys Glu Ile Leu Ile Glu Pro Phe Ser Glu Glu Trp Leu
20 25 30

Gln Pro Ala Gly Tyr Asp Leu Arg Val Gly
35 40

<210> 42
 <211> 740
 <212> DNA
 <213> Pyrococcus furiosus

<220>
 <221> misc_feature
 <222> (1)..(740)
 <223> "n" is a, t, g, or c

<400> 42
 tcctccaagg gaatacgcct taatcctaac cctcgagagg ataaagttgc cgcacgatgt 60
 tatgggggat atgaagataa ggagcagttt agcaagagaa ggggttattg gttcttttgc 120
 ttgggttgac ccaggatggg atggaaactt aacactaatg ctctacaatg cctcaaatga 180
 acctgtcgaa ttaagatatg gagagagatt tgtgcagatc gcatttataa ggctagaggg 240
 tccggcaaga aacccttaca gaggaaacta tcaggggagc acaagggttag cgttttcaaa 300
 gagaaagaaa ctctagcgtc ttttcaatag catcctcaat atctcgtgtg aagtaatcaa 360
 tgtaaatact tgctgggtgg gtttttaggg attcaaactc gtaagatggg cctgtatagc 420
 agaaaactat ttttgcctct tcttcattta tctttctgtg aataaaaaat ccaacatcca 480
 cactagttcc aaaagatatt gtttgcgtga ttaccaacaa gatcttggca ttatttttga 540
 tcttatactc tattctcctt tctccctcca atttgcccaa aataaacctg ggtagtatac 600
 attcactcct ctctttttaa ttcctataaa ttcgtacata gtttagaaaa atgtcaaatt 660
 cttntttccc tgttaaatta accncnaaat ctttatnann aancctttta taattcccaa 720
 aaccctaata tttccccttn 740

<210> 43
 <211> 246
 <212> PRT
 <213> Pyrococcus furiosus

<220>
 <221> MISC_FEATURE
 <222> (1)..(246)

<223> "X" represents any amino acid

<400> 43

Leu Gln Gly Asn Thr Pro Xaa Ser Xaa Pro Ser Arg Gly Xaa Ser Cys
1 5 10 15

Pro Thr Met Leu Trp Gly Ile Xaa Arg Xaa Gly Ala Val Xaa Gln Glu
20 25 30

Lys Gly Leu Leu Val Leu Leu Leu Gly Leu Thr Gln Asp Gly Met Glu
35 40 45

Thr Xaa His Xaa Cys Ser Thr Met Pro Gln Met Asn Leu Ser Asn Xaa
50 55 60

Asp Met Glu Arg Asp Leu Cys Arg Ser His Leu Xaa Gly Xaa Arg Val
65 70 75 80

Arg Gln Glu Thr Leu Thr Glu Glu Thr Ile Arg Gly Ala Gln Gly Xaa
85 90 95

Arg Phe Gln Arg Glu Arg Asn Ser Ser Val Phe Ser Ile Ala Ser Ser
100 105 110

Ile Ser Arg Val Lys Xaa Ser Met Xaa Ile Leu Ala Gly Trp Val Phe
115 120 125

Arg Asp Ser Asn Ser Xaa Asp Gly Pro Val Xaa Gln Lys Thr Ile Phe
130 135 140

Ala Ser Ser Ser Phe Ile Phe Leu Xaa Ile Lys Asn Pro Thr Ser Thr
145 150 155 160

Leu Val Pro Lys Asp Ile Val Cys Val Ile Thr Asn Lys Ile Leu Ala
165 170 175

Leu Phe Leu Ile Leu Tyr Ser Ile Leu Leu Ser Pro Ser Asn Leu Pro
180 185 190

Lys Ile Asn Leu Gly Ser Ile His Ser Leu Leu Ser Phe Lys Phe Leu
195 200 205

Xaa Ile Arg Thr Xaa Phe Arg Lys Met Ser Asn Ser Xaa Phe Pro Val
210 215 220

Lys Leu Thr Xaa Lys Ser Leu Xaa Xaa Xaa Phe Leu Xaa Phe Pro Lys
Page 20

225

230

235

240

Pro Leu Ile Phe Pro Xaa
245

<210> 44

<211> 246

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(246)

<223> "X" represents any amino acid

<400> 44

Pro Pro Arg Glu Tyr Ala Leu Ile Leu Thr Leu Glu Arg Ile Lys Leu
1 5 10 15

Pro Asn Asn Val Met Gly Asp Met Lys Ile Arg Ser Ser Leu Ala Arg
20 25 30

Glu Gly Val Ile Gly Ser Phe Ala Trp Val Asp Pro Gly Trp Asp Gly
35 40 45

Asn Leu Thr Leu Met Leu Tyr Asn Ala Ser Asn Glu Pro Val Glu Leu
50 55 60

Arg Tyr Gly Glu Arg Phe Val Gln Ile Ala Phe Ile Arg Leu Glu Gly
65 70 75 80

Pro Ala Arg Asn Pro Tyr Arg Gly Asn Tyr Gln Gly Ser Thr Arg Leu
85 90 95

Ala Phe Ser Lys Arg Lys Lys Leu Xaa Arg Leu Phe Asn Ser Ile Leu
100 105 110

Asn Ile Ser Cys Glu Val Ile Asn Val Asn Thr Cys Trp Val Gly Phe
115 120 125

Xaa Gly Phe Lys Leu Val Arg Trp Ala Cys Ile Ala Glu Asn Tyr Phe
130 135 140

Cys Leu Phe Phe Ile Tyr Leu Ser Val Asn Lys Lys Ser Asn Ile His
145 150 155 160

Thr Ser Ser Lys Arg Tyr Cys Leu Arg Asp Tyr Gln Gln Asp Leu Gly
165 170 175

Ile Ile Phe Asp Leu Ile Leu Tyr Ser Pro Phe Ser Leu Gln Phe Ala
180 185 190

Gln Asn Lys Pro Gly Xaa Tyr Thr Phe Thr Pro Leu Phe Xaa Ile Pro
195 200 205

Ile Asn Ser Tyr Ile Val Xaa Lys Asn Val Lys Phe Phe Xaa Pro Cys
210 215 220

Xaa Ile Asn Xaa Xaa Ile Phe Xaa Xaa Xaa Leu Phe Ile Ile Pro Lys
225 230 235 240

Thr Pro Asn Phe Pro Leu
245

<210> 45

<211> 246

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(246)

<223> "X" represents any amino acid

<400> 45

Ser Ser Lys Gly Ile Arg Leu Asn Pro Asn Pro Arg Glu Asp Lys Val
1 5 10 15

Ala Arg Arg Cys Tyr Gly Gly Tyr Glu Asp Lys Glu Gln Phe Ser Lys
20 25 30

Arg Arg Gly Tyr Trp Phe Phe Cys Leu Gly Xaa Pro Arg Met Gly Trp
35 40 45

Lys Leu Asn Thr Asn Ala Leu Gln Cys Leu Lys Xaa Thr Cys Arg Ile
Page 22

50

55

60

Lys Ile Trp Arg Glu Ile Cys Ala Asp Arg Ile Tyr Lys Ala Arg Gly
 65 70 75 80

Ser Gly Lys Lys Pro Leu Gln Arg Lys Leu Ser Gly Glu His Lys Val
 85 90 95

Ser Val Phe Lys Glu Lys Glu Thr Leu Ala Ser Phe Gln Xaa His Pro
 100 105 110

Gln Tyr Leu Val Xaa Ser Asn Gln Cys Lys Tyr Leu Leu Gly Gly Phe
 115 120 125

Leu Gly Ile Gln Thr Arg Lys Met Gly Leu Tyr Ser Arg Lys Leu Phe
 130 135 140

Leu Pro Leu Leu His Leu Ser Phe Cys Glu Xaa Lys Ile Gln His Pro
 145 150 155 160

His Xaa Phe Gln Lys Ile Leu Phe Ala Xaa Leu Pro Thr Arg Ser Trp
 165 170 175

His Tyr Phe Xaa Ser Tyr Thr Leu Phe Ser Phe Leu Pro Pro Ile Cys
 180 185 190

Pro Lys Xaa Thr Trp Val Val Tyr Ile His Ser Ser Leu Leu Asn Ser
 195 200 205

Tyr Lys Phe Val His Ser Leu Glu Lys Cys Gln Ile Leu Xaa Ser Leu
 210 215 220

Leu Asn Xaa Pro Xaa Asn Leu Tyr Xaa Xaa Xaa Phe Tyr Asn Ser Gln
 225 230 235 240

Asn Pro Xaa Phe Ser Pro
 245

<210> 46

<211> 31

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(31)

<223> "X" represents any amino acid

<400> 46

Met Leu His His Val Lys Leu Ile Tyr Ala Thr Lys Ser Arg Lys Leu
1 5 10 15

Val Gly Lys Lys Ile Val Xaa Xaa Xaa Pro Gly Ser Ile Ala Ala
20 25 30

<210> 47

<211> 17

<212> PRT

<213> Pyrococcus furiosus

<400> 47

Lys Tyr Asp Val Val Ile Met Ala Ala Ala Val Ser Asp Phe Arg Phe
1 5 10 15

Lys

<210> 48

<211> 24

<212> PRT

<213> Pyrococcus furiosus

<400> 48

Ala Asp Leu Val Val Gly Asn Thr Leu Glu Ala Phe Gly Ser Glu Glu
1 5 10 15

Asn Gln Val Val Leu Ile Gly Arg
20

<210> 49

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 49

ctattgagta cgaacgccat c

21

<210> 50

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 50

gtcacgcttg ctccactccg

20

<210> 51

<211> 437

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(437)

<223> "X" represents any amino acid

<400> 51

Met Ile Ser Glu Ile Met His Pro Thr Lys Leu Leu Lys Gly Thr Lys
1 5 10 15

Ser Lys Leu Leu Glu Asn Lys Lys Ile Leu Val Ala Val Thr Ser Ser
20 25 30

Ile Ala Ala Ile Glu Thr Pro Lys Leu Met Arg Glu Leu Ile Arg His
35 40 45

Gly Ala Glu val Tyr Cys Ile Ile Thr Glu Glu Thr Lys Lys Ile Ile
Page 25

105

C

50

55

60

Gly Lys Glu Ala Leu Lys Phe Gly Cys Gly Asn Glu Val Tyr Glu Glu
65 70 75 80

Ile Thr Gly Xaa Xaa Xaa Xaa Xaa Asp Ile Glu His Ile Leu Leu Tyr
85 90 95

Xaa Xaa Xaa Xaa Asn Glu Cys Asp Cys Leu Leu Ile Tyr Pro Ala Thr
100 105 110

Ala Asn Ile Ile Ser Lys Ile Asn Leu Gly Ile Ala Asp Asn Ile Val
115 120 125

Asn Thr Thr Ala Leu Met Phe Phe Gly Asn Lys Pro Ile Phe Ile Val
130 135 140

Pro Ala Met His Glu Asn Met Phe Asn Xaa Xaa Ala Ile Lys Arg His
145 150 155 160

Ile Asp Lys Leu Lys Glu Lys Asp Lys Ile Tyr Ile Ile Ser Pro Lys
165 170 175

Phe Glu Glu Xaa Xaa Xaa Xaa Xaa Xaa Gly Lys Ala Lys Val Ala Asn
180 185 190

Ile Glu Asp Val Val Lys Ala Val Ile Glu Lys Ile Gly Asn Asn Leu
195 200 205

Lys Lys Glu Gly Asn Arg Val Leu Ile Leu Asn Gly Gly Thr Val Glu
210 215 220

Phe Ile Asp Lys Val Arg Val Ile Ser Asn Leu Ser Ser Gly Lys Met
225 230 235 240

Gly Val Ala Leu Ala Glu Ala Phe Cys Lys Glu Gly Phe Tyr Val Glu
245 250 255

Val Ile Thr Ala Met Gly Leu Glu Pro Pro Tyr Tyr Ile Lys Asn His
260 265 270

Lys Val Leu Thr Ala Lys Glu Met Leu Asn Lys Ala Ile Glu Xaa Xaa
275 280 285

Leu Xaa Ala Lys Asp Phe Asp Ile Ile Ile Ser Ser Ala Ala Ile Ser
290 295 300

Asp Phe Thr Val Glu Ser Xaa Phe Glu Gly Lys Leu Ser Ser Glu Glu
Page 26

106

C

305 310 315 320

Glu Xaa Xaa Xaa Xaa Leu Ile Leu Lys Leu Lys Arg Xaa Asn Pro Lys
325 330 335

Val Leu Glu Glu Leu Arg Arg Ile Tyr Lys Asp Xaa Lys Val Ile Ile
340 345 350

Gly Phe Lys Ala Glu Tyr Asn Leu Asp Glu Lys Glu Leu Ile Asn Arg
355 360 365

Ala Lys Glu Arg Leu Asn Lys Tyr Asn Leu Asn Met Ile Ile Ala Asn
370 375 380

Asp Leu Ser Lys Xaa Xaa His Tyr Phe Gly Asp Asp Tyr Ile Glu Val
385 390 395 400

Tyr Ile Ile Thr Lys Tyr Glu Val Glu Lys Ile Ser Gly Ser Lys Lys
405 410 415

Xaa Glu Ile Ser Glu Arg Ile Val Glu Lys Val Lys Lys Leu Val Lys
420 425 430

Ser Xaa Xaa Xaa Xaa
435

<210> 52

<211> 444

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(444)

<223> "X" represents any amino acid

<400> 52

Met Lys Ala Arg Gln Gln Lys Tyr Cys Asp Lys Ile Ala Asn Phe Trp
1 5 10 15

Cys His Pro Thr Gly Lys Ile Ile Met Ser Leu Ala Gly Lys Lys Ile
20 25 30

Val Leu Gly Val Ser Gly Gly Ile Ala Ala Tyr Lys Thr Pro Glu Leu
 35 40 45
 Val Arg Arg Leu Arg Asp Arg Gly Ala Asp Val Arg Val Ala Met Thr
 50 55 60
 Glu Ala Ala Lys Ala Phe Ile Thr Pro Leu Ser Leu Gln Ala Val Ser
 65 70 75 80
 Gly Tyr Pro Val Ser Asp Ser Leu Leu Asp Pro Ala Ala Glu Ala Ala
 85 90 95
 Met Gly His Ile Glu Leu Gly Xaa Xaa Xaa Xaa Lys Trp Ala Asp Leu
 100 105 110
 Val Ile Leu Ala Pro Ala Thr Ala Asp Leu Ile Ala Arg Val Ala Ala
 115 120 125
 Gly Met Ala Asn Asp Leu Val Ser Thr Ile Cys Leu Ala Thr Pro Xaa
 130 135 140
 Xaa Ala Pro Val Ala Val Leu Pro Ala Met Asn Gln Gln Met Tyr Arg
 145 150 155 160
 Ala Ala Ala Thr Gln His Asn Leu Glu Val Leu Ala Xaa Ser Arg Gly
 165 170 175
 Leu Leu Ile Trp Gly Pro Asp Ser Gly Ser Gln Ala Cys Gly Asp Ile
 180 185 190
 Gly Pro Gly Arg Xaa Xaa Asp Pro Leu Thr Ile Val Asp Met Ala Val
 195 200 205
 Ala His Phe Ser Pro Val Asn Asp Leu Lys His Leu Asn Ile Met Ile
 210 215 220
 Thr Ala Gly Pro Thr Arg Glu Pro Leu Asp Pro Val Arg Tyr Ile Ser
 225 230 235 240
 Asn His Ser Ser Gly Lys Met Gly Phe Ala Ile Ala Ala Ala Ala Ala
 245 250 255
 Arg Arg Gly Ala Asn Val Thr Leu Val Ser Gly Pro Val Ser Leu Pro
 260 265 270
 Thr Pro Pro Phe Val Lys Arg Val Asp Val Met Thr Ala Leu Glu Met
 275 280 285

Glu Ala Ala Val Asn Xaa Xaa Ala Ser Val Gln Gln Gln Asn Ile Phe
290 295 300

Ile Gly Cys Ala Ala Val Ala Asp Tyr Arg Ala Ala Thr Val Ala Pro
305 310 315 320

Glu Lys Ile Lys Lys Gln Ala Thr Gln Gly Asp Glu Leu Thr Ile Lys
325 330 335

Met Val Lys Xaa Asn Pro Asp Ile Val Ala Gly Val Ala Ala Leu Lys
340 345 350

Asp His Arg Pro Tyr Val Val Gly Phe Ala Ala Glu Thr Asn Asn Xaa
355 360 365

Xaa Xaa Xaa Val Glu Glu Tyr Ala Arg Gln Lys Arg Ile Arg Lys Asn
370 375 380

Leu Asp Leu Ile Cys Ala Asn Asp Val Ser Gln Pro Thr Gln Gly Phe
385 390 395 400

Asn Ser Asp Asn Asn Ala Leu His Leu Phe Trp Gln Asp Gly Asp Lys
405 410 415

Val Leu Pro Leu Glu Arg Lys Glu Leu Leu Gly Gln Leu Leu Leu Asp
420 425 430

Glu Ile Val Thr Arg Tyr Asp Glu Lys Asn Arg Arg
435 440

<210> 53

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<220>

<221> MISC_FEATURE

<222> (1)..(14)

<223> "X" represents any amino acid

<400> 53

Xaa Gly Xaa Xaa Asp Xaa Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa
Page 29

109

C

1 5 10

<210> 54

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<400> 54

Phe Ala Trp Val Asp Pro Gly Trp Asp Gly Asn Thr Leu Met
1 5 10

<210> 55

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<400> 55

Ala Gly Trp Ile Asp Ala Gly Phe Lys Gly Lys Ile Thr Leu
1 5 10

<210> 56

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<400> 56

Ser Ala Val His Asp Pro Gly Tyr Glu Gly Arg Pro Glu Tyr
1 5 10

<210> 57

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<400> 57

Pro Thr Ile Val Asp Ala Gly Phe Glu Gly Gln Leu Thr Ile
Page 30

1 5 10

<210> 58

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<400> 58

Ala His Arg Ile Asp Pro Gly Trp Ser Gly Cys Ile Val Leu
1 5 10

<210> 59

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 59

gagttaaatg cctacactgt atct

24

<210> 60

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 60

caggactcag aagctgctat cgaa

24

<210> 61

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 61

ctgcacgtgc cctgtaggat ttgt

24

<210> 62

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 62

ctattgagta cgaacgccat c

21

<210> 63

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 63

gtcacgcttg ctccactccg

20

<210> 64

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 64

gaggagagca ggaaaggtgg aac

23

<210> 65

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 65

gctgggagaa gacttcactg g

21

<210> 66

<211> 8

<212> PRT

<213> Pyrococcus furiosus

<400> 66

His His Val Lys Leu Ile Tyr Ala
1 5

<210> 67

<211> 8

<212> PRT

<213> Pyrococcus furiosus

<400> 67

Lys Tyr Asp Ala Val Ile Met Ala
1 5

<210> 68

<211> 7

<212> PRT

<213> Pyrococcus furiosus

<400> 68

Glu Glu Asn Gln Val Val Leu
1 5

<210> 69

<211> 8

<212> PRT

<213> Pyrococcus furiosus

<400> 69

Pro Asp Trp Lys Ile Arg Lys Glu
1 5

<210> 70

<211> 471

<212> DNA

<213> Pyrococcus furiosus

<400> 70

atgctacttc cagactggaa aatcagaaaa gaaatactta tagagccatt ttctgaagaa	60
tcgctccaac cagcagggtta tgacctcaga gtgggcagag aggcttttgt taaggggaaa	120
ttaatcgacg tggaaaagga aggaaaagtc gttattcctc caagggaata cgccttaatc	180
ctaaccctcg agaggataaa gttgcccgcac gatgttatgg gggatatgaa gataaggagc	240
agtttagcaa gagaaggggt tattggttct tttgcttggg ttgaccagg atgggatgga	300
aacttaacac taatgctcta caatgcctca aatgaacctg tcgaattaag atatggagag	360
agatttgtgc agatcgatt tataaggcta gaggggtccg caagaaacc ttacagagga	420
aactatcagg ggagcacaag gttagcgttt tcaaagagaa agaaactcta g	471

<210> 71

<211> 156

<212> PRT

<213> Pyrococcus furiosus

<400> 71

Met Leu Leu Pro Asp Trp Lys Ile Arg Lys Glu Ile Leu Ile Glu Pro
1 5 10 15

Phe Ser Glu Glu Ser Leu Gln Pro Ala Gly Tyr Asp Leu Arg Val Gly
20 25 30

Arg Glu Ala Phe Val Lys Gly Lys Leu Ile Asp Val Glu Lys Glu Gly
35 40 45

Lys Val Val Ile Pro Pro Arg Glu Tyr Ala Leu Ile Leu Thr Leu Glu
50 55 60

Arg Ile Lys Leu Pro Asp Asp Val Met Gly Asp Met Lys Ile Arg Ser
65 70 75 80

Ser Leu Ala Arg Glu Gly Val Ile Gly Ser Phe Ala Trp Val Asp Pro
85 90 95

Gly Trp Asp Gly Asn Leu Thr Leu Met Leu Tyr Asn Ala Ser Asn Glu
100 105 110

Pro Val Glu Leu Arg Tyr Gly Glu Arg Phe Val Gln Ile Ala Phe Ile
115 120 125

Arg Leu Glu Gly Pro Ala Arg Asn Pro Tyr Arg Gly Asn Tyr Gln Gly
130 135 140

Ser Thr Arg Leu Ala Phe Ser Lys Arg Lys Lys Leu
145 150 155

<210> 72

<211> 13

<212> PRT

<213> uridine-binding motif

<220>

<221> MISC_FEATURE

<222> (1)..(13)

<223> "X" represents any amino acid

<400> 72

Xaa Gly Xaa Xaa Asp Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa
1 5 10

<210> 73

<211> 14

<212> PRT

<213> Pyrococcus furiosus

<400> 73

Phe Ala Trp Val Asp Pro Gly Trp Asp Gly Asn Thr Leu Met
1 5 10

<210> 74

<211> 14

<212> PRT

<213> Methanococcus jannaschii

<400> 74

Ala Gly Trp Ile Asp Ala Gly Phe Lys Gly Lys Ile Thr Leu
1 5 10

<210> 75

<211> 14

<212> PRT

<213> Methanococcus jannaschii put.

<400> 75

Ser Ala Val His Asp Pro Gly Tyr Glu Gly Arg Pro Glu Tyr
1 5 10

<210> 76

<211> 14

<212> PRT

<213> D. sulf.

<400> 76

Pro Thr Ile Val Asp Ala Gly Phe Glu Gly Gln Leu Thr Ile
1 5 10

<210> 77

<211> 14

<212> PRT

<213> Escherichia coli

<400> 77

Ala His Arg Ile Asp Pro Gly Trp Ser Gly Cys Ile Val Leu
1 5 10

<210> 78

<211> 14

<212> PRT

<213> Escherichia coli

<400> 78

Val Gly Leu Ile Asp Ser Asp Tyr Gln Gly Gln Leu Met Ile
1 5 10

<210> 79

<211> 14

<212> PRT

<213> Yeast

<400> 79

Ala Gly Val Val Asp Arg Asp Tyr Thr Gly Glu Val Lys Val
1 5 10

<210> 80

<211> 14

<212> PRT

<213> Homo sapiens

<400> 80

Ala Gly Val Ile Asp Glu Asp Tyr Arg Gly Asn Val Gly Val
1 5 10

<210> 81

<211> 14

<212> PRT

<213> Herpes Virus

<400> 81

Thr Gly Leu Ile Asp Pro Gly Phe Gln Gly Glu Leu Lys Leu
1 5 10

<210> 82

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 82

gacgacgaca agatgctact tccagactgg aaa

33

<210> 83

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 83

ggaacaagac ccgtcccact ttcacagatg aagag

35

<210> 84

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 84

gaggagagca ggaaaggtgg aac

23

<210> 85
<211> 23
<212> DNA
<213> Artificial Sequence

<220>

<223> synthetic

<400> 85
ctccatgtcc caactccgat cac

23

<210> 86
<211> 38
<212> DNA
<213> Artificial Sequence

<220>

<223> synthetic

<400> 86
ggttttccca gtcacgacgt tgtaaaacga cggccagt

38

<210> 87
<211> 38
<212> RNA
<213> Artificial Sequence

<220>

<223> synthetic

<400> 87
gguuuuccca gucacgacgu uguaaaacga cggccagu

38

<210> 88
<211> 35
<212> DNA
<213> Artificial Sequence

<220>

<223> synthetic

<400> 88

gacgacgaca agatgccctg ctctgaagag acacc

35

<210> 89

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> synthetic

<400> 89

ggaacaagac ccgtttaatt cttccagtg gaacc

35